The Aesthetic Experience with Visual Art "At First Glance"

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Abstract The aesthetic experience with visual art has been shown to occur in two stages. Upon initial exposure to a painting, a viewer spontaneously generates a global impression, or gist, of the work. One's first impression of a painting includes a sense of its pictorial content, overall structural organization and style, meaningfulness, and an affective reaction to it. When gist information in a painting is deemed to have sufficient interest to an observer, the second stage of aesthetic processing ensues. This consists of directed focal exploration of the image to expand knowledge concerning the work's compositional features and organization to satisfy cognitive curiosity and to develop aesthetic appreciation of a composition. This chapter presents an overview of research findings that have identified the types of visual properties and semantically related information that collectively lead to the activation of what is labeled a "painting gist" by this author. In addition, the influence of the painting gist response on the focal exploration of paintings is discussed.

Keywords Painting gist • Tachistoscopic presentation • Perceptual processing • Eye-tracking • Masking technique • Pictorial content • Pictorial style

The casual visitor in a museum gallery typically glances at a painting and based on a first impression, or gist, of it either almost immediately moves on to another work or stops to spend some time with it. The gist of a painting generated by individuals unsophisticated in the visual arts is the product of the pictorial content of a work interacting with the viewer's personal context that reflects his or her cognitive structures (see Locher 2012). Art professionals initially respond to paintings in a similar fashion. For example, Batinic (2005) asked a large sample of specialist visitors at the international art fair *Art de Cologne* to rate the individual factors that influence their decision to buy a work of art. They gave most weight to their first impression of a work, followed closely by its style and price. Similarly, Grasset

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P.F. Bundgaard, F. Stjernfelt (eds.), *Investigations Into the Phenomenology and the Ontology of the Work of Art*, Contributions To Phenomenology 81,
DOI 10.1007/978-3-319-14090-2_5

(1998) claims that the process of evaluating the authenticity of a painting suspected of being a fake or forgery by museum and art professionals frequently begins with the emotional experience given by their first visual encounter with it. This reaction leaves an unforgettable impression that leads to a good part of further investigation. In the case of art professionals, this "gut feeling" is inspired by a frequent and repeated acquaintance with truly authentic works of the same period, region, and the artist to whom the work is attributed.

1 The Painting Gist

Unsophisticated and art-trained individuals' initial aesthetic reaction to an artwork, just as with many types of non-aesthetic everyday stimuli, constitutes the first stage of a broad two-stage processing framework of aesthetic experience with visual art proposed by this author and his colleagues (e.g., Locher et al. 2007; Locher 2012; Nodine et al. 1993).[1] According to this framework, which is based on early psychological theories of aesthetics (see Eysenck 1942), a viewer spontaneously generates a global impression, or gist, of a painting with the first glance at it. As described in detail below, one's first impression includes a sense of a work's pictorial content, its global structural organization, its semantic meaning, and an initial affective response to it. These pictorial qualities and meanings simply "happen" in immediate awareness of the retinal image of an artwork and, as such, the gist is pre-cognitive in nature. Its content appears as a single, indivisible entity (Koenderink 2011, p. 320). When gist information in a painting is deemed by a viewer to have sufficient interest, the second phase of aesthetic processing ensues. This consists of directed focal exploration of the image to build up knowledge about interesting pictorial features and their structural organization to satisfy cognitive curiosity and to develop aesthetic appreciation of the painting. The purpose of this chapter is to provide an overview of experimental investigations conducted from early to recent times that describe the types of visual properties and semantically related information that collectively contribute to the activation of what I call the "painting gist." To limit the content of the chapter and to maximize credibility and persuasiveness of the findings to scholars and professionals in the field of aesthetics, only studies that used reproductions of paintings as stimuli are reported to the exclusion of stimuli used in investigations of other forms of gist responses such as scene gist (e.g., Castelhano and Henderson 2008; Grossberg and Huang 2009).

The methodology used to investigate the painting gist is common to all of the experiments described in this review. First, each study utilized flash (tachistoscopic) presentations of paintings with at least one duration less than approximately 250 ms.

[1] More detailed multicomponent information processing models of an aesthetic experience with art have been proposed by Leder et al. (2004) and Tinio (2013) and with design objects (Locher et al. 2010).

This duration reflects the perceptually relevant average pause time of single eye fixations for adults performing a search-type task. Thus, its use ensures that subjects generated a gist response based on the emergence of information available in just the initial fixation on a painting. In addition, a masking pattern presented after (or before and after) the stimulus is typically utilized with tachistoscopic presentations to terminate the visual image at the offset of the physical stimulus. This is done so that the time available for extracting information from a given glimpse is carefully controlled and a viewer's performance reflects perceptual processing efficiency during specific intervals of constant durations.[2] Whether masking was used or not is mentioned for each study described throughout the review.

As stated, the purpose of the studies described in this chapter was to identify the various types of compositional elements that can be discriminated by a viewer in a snapshot of time. Locher (2014) points out that the composition of a painting is built up of three types or levels of image content and organization. At the lowest level of stimulation are the individual first-order pictorial elements of painting such as line, color, texture, and shape. Although the influence of primary features on the perception and aesthetic evaluation of paintings has received considerable experimental scrutiny (see Locher [2014] for a review of this literature), researchers have not studied the contribution of first-order properties to the emergence of the painting gist. This is likely due in part to the assumption that a gist response occurs in response to the overall structural organization of a painting. The findings of a study conducted by Locher et al. (2007) (described later in detail) revealed that, in fact, less than 2 % of viewers' verbal reactions to paintings seen for just 100 ms were of the first-order type (e.g., reference made to the line orientations or colors in a composition). Holistic second-order pictorial features such as complexity, symmetry, balance, perspective, and depicted motion are created by structural coupling of first-order pictorial elements. At the next highest level of organization, pictorial attributes are arranged by the artist into a composition that conveys through its content and artistic style the conceptual and semantic meaning of a work. All of the studies included in this review have utilized second and third levels of compositional components to investigate the activation of painting gist.

2 Early Investigations of the Nature of the Painting Gist

We turn now to a review of the research designed to provide information concerning the nature of the painting gist response. One of the earliest experimental studies in this field was performed by Brighouse in 1939. His art stimuli were 10 paintings

[2]For a detailed description of the mechanisms underlying visual masking, the reader is directed to Bachmann et al.'s (2007) overview of the contents of a collection of articles (published as a Special Edition of the journal *Psychological Research*) that shed light on the mechanisms of visual masking models and how our perceptions are created in a snapshot of time.

representing a variety of subject matter and styles (e.g., paintings by Braque, El Greco, Renoir, Hokusai) and his participants included children from 8 to 14 years of age, adults with no training in the visual arts, and graduate students and faculty in a Department of Graphics and Plastic arts. Participants were shown each painting tachistoscopically for 260 ms without masking and when the image disappeared they told the experimenter everything that went through their minds based on the snapshot view of the painting. This procedure was repeated until a participant felt that he/she had acquired all the information and hedonic value the picture had to offer and that nothing new would occur with further exposures. Additionally, participants were instructed to tell the experimenter as soon as they knew they liked or disliked the picture. After viewing each painting tachistoscopically, it was projected normally and participants had unlimited time to rate how much they liked it now that they could examine it carefully.

Brighouse (1939) reported that 78 % of all children and untrained adults gave verbal expressions of pleasure, indifference or dislike following the first exposure of a painting and they made practically no corrections to their initial expressions of affect after viewing paintings for a median number of 7.2 and 11.4 exposures per stimulus, respectively. Taken together, these findings provide evidence for the existence of a painting gist. Not surprisingly, trained viewers were more hesitant to express an affective reaction and only 55 % did so by the fifth exposure. They also exhibited a greater tendency to modify their expressed feelings about a work following unlimited viewing than did children and untrained adults. According to Brighouse, this observation suggests that the immediate hedonic tone of the paintings was minimized in importance by the trained individuals in favor of a much more carefully weighed judgment based on careful examination of an artwork. An interesting and very forward thinking aspect of this research is that Brighouse used the contents of participants' verbal reports following each flash presentation to suggest the temporal course of the perceptual processes underlying viewing of the artworks, much in the same way as a viewer's fixations pattern is used in later eye-movement studies to infer the same type of information (e.g., Locher et al. 2007).

Eysenck (1942) repeated Brighouse's (1939) study with three subjects chosen for their "aesthetic abilities." They were shown 50 uncolored paintings by a variety of artists for 40 ms followed by "a way to eliminate after-images" (p. 350). Subjects indicated their liking for each artwork following its brief presentation and again after a second unlimited viewing time exposure. The correlations between the two sets of ratings for the three participants were .82, .80, and .76 resulting in Eysenck's conclusion that "*the appreciation of the aesthetic worth of a picture may be as instantaneous as the perception of the picture itself*" (p. 351, italics in the original).

In another early study also published in 1939, Kellett (Procedure 1) used reproductions of 14 paintings representing different artistic styles as stimuli (e.g., works by Marin, Rousseau, Vermeer, van Gogh). Each painting was paired with a photograph either taken at the actual scene of an artist's work or a studio set-up photograph that attempted to simulate an artist's painting. According to Kellett, this procedure resulted in pairs of relatively well unified (the photographs) and less successfully unified (the paintings) stimulus objects. Participants were high school

students classified as either "untrained" or "trained" in the arts, the later defined as having had at least two semesters of high school art training. Participants saw a painting and its paired photograph each randomly displayed one after the other for 240 ms unmasked after which they indicated the version they preferred. This procedure was repeated with presentation time set at 30 s. The key finding for the present discussion was that preferences for images given in the short time condition were highly stable, with stability being 72 % or higher for 11 of the 14 stimulus pairs. There was a negligible difference in preferences expressed by the untrained and trained groups.

The studies described in this section were "devised to throw light upon the functioning of the aesthetic elements and principles in a painting" (Brighouse 1939, p. 1). These investigations were conducted before the notion of a gist response was introduced in the literature. Nevertheless, as will become apparent throughout this review, the research questions addressed in these early studies as well as their findings are fundamentally the same as those of more recent investigations designed to clarify which components of aesthetic stimuli contribute to the painting gist.

3 Pre-attentive Detection of the Collative Properties of Paintings

Cupchik and Berlyne (1979) conducted two tachistoscopic experiments to determine how soon during the processing of an aesthetic stimulus one could discern collative properties. According to Berlyne (1971), a collative stimulus property is created by spontaneous organization of stimulus elements into a perceptual configuration. They require an observer to note, put together, and sum up characteristics of several elements that are present simultaneously in a painting (p. 69) (i.e., structural properties at the second- and highest-order organization levels). Cupchik and Berlyne note that, prior to the publication of their study, almost all investigations on aesthetic perception permitted participants multiple glances at the stimulus. Their study was designed to address this limitation in the field. In a first experiment, they presented university students untrained in the visual arts with 12 color reproductions of paintings by such artists as Rubens, Renoir, Poussin, and Pissarro. (Twelve patterns consisting of black and white squares were also used as stimuli but these are not discussed here.) The paintings represented high and low levels of the collative properties uncertainty, arousal, and hedonic tone. Factor analytic and multidimensional scaling techniques were applied to a large collection of artworks in a previous study by the researchers to generate these classes of stimulus materials. For example, high and low levels of the uncertainty factor consisted of paintings' ratings on a number of scales such as disorderly-orderly and simple-complex.

Each stimulus was evaluated following one of three exposure durations—50, 500, and 5,000 ms—that were preceded and followed by a blank white exposure field. Following each stimulus presentation, the painting was rated on five scales: simple-

complex; disorderly-orderly; displeasing-pleasing; drowsy-alert and relaxed-tense. Results revealed that participants were able to discriminate complexity levels after only a single fixation. They also rated high arousal paintings less pleasing and more tension producing after a single glance. In addition, the 50 ms exposure condition evoked greater alertness and attention than did the 500 ms and 5,000 ms duration conditions.

In a second experiment, Cupchik and Berlyne (1979) investigated the motivational implications of the existence of a gist response on the second-stage of perceptual processing using a binary preference method. The same 12 art stimuli used in Experiment 1 (and also the patterns) were presented in pairs at one of the three presentation durations utilized in the first experiment, with each pair including one painting that was high and the other low on the uncertainty, arousal, and hedonic tone properties. Participants were instructed to choose which painting of the pair they would like to see again for an additional 5 s (a pseudo-task not performed) and to rate how much they preferred it over the painting not selected (this measure did not prove fruitful and no results were presented). The findings revealed that for exploratory choice, participants were particularly sensitive to the paintings' order or unity after only a single 50 ms glance at the pairs. On the other hand, participants chose high uncertainty paintings for a second look in the multiple fixation conditions (500 and 5,000 ms), but no clear preference was observed following the 50 ms presentation despite the findings that participants were able to discriminate between low and high uncertainty images in Experiment 1. Cupchik and Berlyne suggest that this finding supports the principle of "perceptual curiosity" (Berlyne 1963), a motive to reduce stimulus uncertainty through expanded exploration of stimulus details (i.e., stage 2 processing of an aesthetic experience).

As mentioned, Cupchik and Berlyne's (1979) study addressed an important limitation of almost all investigations on the nature of aesthetic perception prior to theirs, namely, that participants were permitted multiple glances at the art stimuli. The researchers demonstrated viewers' ability to discriminate certain collative properties of artworks such as complexity and order after a single initial glance at it. Their findings provide early support for the view that the initial phase of perception of an aesthetic stimulus begins with the holistic processing of a painting's structural and organizational properties.

4 Pictorial Balance—A Perceptual Primitive

It is a widely held belief among artists and art theoreticians from ancient times to the present that balance is the primary design principle for unifying the structural elements of a painting into a cohesive narrative statement (see Arnheim 1988). Furthermore, it is believed in the art world that the induced organizational structure resulting from the balanced configuration of a painting is established spontaneously by vision and that it determines how the elements of a composition are visually scanned, interpreted, and evaluated (Locher 2003). Moreover, this view suggests

that the global percept is a "structural primitive" that can be detected rapidly and effortlessly in a painting by all viewers regardless of their background in the visual arts. A tachistoscopic study by Locher and Nagy (1996) support these assertions. Their stimuli consisted of black-and-white more- and less-balanced version(s) of the same painting taken from plates of the *Maitland Graves Design Judgment Test* and the *Meier Art Tests I and II* measures. The images were balanced about either the horizontal or vertical axis. In addition, color reproductions of highly perceptually balanced paintings by renowned artists (e.g., Kandinsky, Sargent, Vuillard) and an experimentally altered less balanced version of each original were employed. The full set of images included a range of stylistic characteristics along the dimensions linear-painterly and abstract-representational. Participants, who either held a Bachelor's degree in Art History or had no formal training in the visual arts, rated for balance each of the 40 stimuli following a 100 ms presentation (pre- and post-exposure mask employed) and then again following a 5,000 ms exposure.

Results revealed that both art naïve and sophisticated individuals discriminated the less balanced from the more balanced versions of the black-and-white paintings with a single 100 ms glance at each. They were also able to discern the large differences in balance among the original paintings in the single fixation condition, but were not able to reliably detect the subtle differences in balance between the balanced and slightly less balanced versions of each painting. Locher and Nagy's (1996) findings provide empirical support for the view held by artists and art theoreticians that pictorial balance is an holistic second-order pictorial feature that simply "happens" in the immediate awareness of an artwork.

5 Meaningfulness Is Detectable in Painting Gist Perception

Meaning, according to Martindale's (1991) theory of cognitive hedonics, is a prime determinant of aesthetic appreciation that overshadows other properties. Meaningfulness is a function of the following variables: the personal relevance of a painting's components to a viewer, the prototypicality of its components, and how clear and naturalistic they are. Moore et al. (2006) conducted a study demonstrating the influence of meaning over other determinants of preference at the pre-attentive stage of processing. They showed artistically-naïve university students 32 paintings ranging in style and period that were previously rated for perceived unity, meaningfulness, and preference. Participants saw each artwork for 10, 100, or 1,000 ms (without backward masking), after which they rated them for preference, unity, and variety.

With respect to participants' preference ratings, eight paintings were consistently among the most preferred at any exposure duration and these had been previously rated very high on meaningfulness. These works consist of many everyday naturalistic scenes with clear details, such as Seurat's *Bathers in the Seine*. Similarly, eight paintings were consistently among the least preferred regardless of exposure duration. These paintings are composed of unfamiliar or unnatural scenes

lacking much meaning to the participants, such as David's *Oath of Horatic*. Two other classes of paintings were observed with respect to preference, works whose ratings increased and those whose ratings decreased across presentation conditions (examples are Turner's *Venice, The Piazetta from the Water* and Kneller's *Triumph of Marlborough*, respectively). In the first case, the researchers speculate that the increase in preference was due to the fact that the content of the paintings became more vivid and clear as details became more visible with increased processing time. Preference ratings decreased across the second group of paintings because their details, which seem simple and orderly when the structure was shown briefly, appeared unfamiliar and/or incongruous (i.e., less meaningful) with longer visual access to the image. Moore et al.'s (2006) findings demonstrate that, consistent with Martindale's theory of cognitive hedonics, meaningfulness is a prime determinate of a painting's composition and its effect is already evident at the pre-attentive stage of an aesthetic experience.

6 Categorization of a Painting's Content and Style at First Glance

At the highest level of compositional organization, there are content and structural properties of paintings that contribute to an aesthetic experience that differentiate artworks from every day visual displays (see Locher 2014; Tinio 2013). Compositional content (or subject matter) and artistic style are two such art-related properties of a painting that contribute to an observer's interpretation, aesthetic judgment, and emotions regarding it. With respect to content, schools of art tend to differ in their choice of motifs such as those found in landscapes, still-life, and portraits. In addition to affectively neutral subject matter, the contents of some artworks depict positive or negative themes designed to evoke positive or negative emotions (see, e.g., Silvia 2012). And viewers' appraisals of comprehensibility and novelty of the contents of a painting along the realism and abstractionism continuum also contribute to their interest in it. Artistic style of a painting refers to the visual appearance of a painting as it relates to other artworks produced in a certain period of time and place by a certain group of artists (i.e., schools of art). Finally, it must be mentioned that a viewer's level of aesthetic fluency, defined by Smith and Smith (2006) as the knowledge base that one has about art and aspects of life closely related to art, will determine the extent to which a painting's style and content influence one's aesthetic experience with it.

Bachmann and Vipper (1983) conducted a study to compare the dynamics of perceiving paintings belonging to different well-known schools of art during the initial stage of processing. They sought to determine which pictorial dimensions were best able to differentiate paintings from among the various schools of art and also the dimensions best able to differentiate the perception of one painting from others. University students with no special education in art rated slides of paintings belong-

ing to six different schools of art—Expressionism, Naivism, Realism, Surrealism, Abstractionism, and Impressionism—on six semantic differential scales: simple-complex, involved-indifferent, regular-chaotic, passive-active, vigorous-impotent, and precise-vague. Four different exposure durations were employed—1, 20, 100, or 500 ms (no mention is made that a mask was used). Bachmann and Vipper found that even at the shortest exposure times (1 ms and 20 ms), participants were able to significantly differentiate between schools of art on the scales simple-complex, involved-indifferent, regular-chaotic and precise-vague, with the most divergent schools being Realism versus Abstractionism. Additionally, they observed that, with increased exposure durations, the ratings pooled across schools became increasingly "simple," "regular," "precise," "involved," "vigorous," and "passive." The researchers interpreted these findings as demonstrating a gradual reduction of visual uncertainty over time concerning the pictorial information available in the painting gist.

Findings reported thus far demonstrate that people are able to detect the content and style properties of a painting on the basis of information contained in the gist. Augustin and her colleagues (Augustin et al. 2008, 2011) conducted a series of experiments designed to investigate the time course and interrelations between content- and style-related processing and to determine when and how these characteristics of paintings play a role during the initial perception of an artwork. Stimuli in their first investigation (Augustin et al. 2008) consisted of 48 reproductions of paintings representing four contents, or motifs, (house, flowers, tree/trees, and a male person) fully crossed with four individual artist styles (works by the artists Cézanne, Chagall, Kirchner, and van Gogh). Art-naïve university students gave similarity ratings for pairs of pictures seen for 10, 50, 200, 3,000 ms or for unlimited viewing time. A delayed masking procedure followed the 10 ms and 50 ms presentations.

Findings revealed that the effects of content were already present at 10 ms and remained relatively stable over all presentation durations whereas the influence of style on perception was only apparent at 50 ms and gained in relevance with increasing presentation times. Augustin et al. (2008) argue that this difference likely reflects the fact that processing of a painting's content is related to general processes of everyday object perception which is presumed to rely on rapid, automatic feed-forward mechanisms. Style on the other hand constitutes a complex combination of different feature aspects of an artwork learned through experience that are art-specific and therefore exert some top-down influence on processing. Related to this explanation is the important finding that participants who were untrained in the visual arts differentiated between different artist styles on the basis of information available in the initial fixation on an artwork. Augustin et al. suggest that this sensitivity to artistic styles may reflect the fact that judgments of similarity of the pairs of artworks did not require explicit classification of styles but could be accomplished using lower-level compositional features such as the use of color, brush strokes, etc.

Following up on their earlier findings, Augustin et al. (2011) investigated the temporal relation between style- and content-related processing of representational

art to identify when sufficient information is available to allow accurate classification of paintings. The two levels of artistic style employed consisted of paintings by two artists with very distinctive individual styles, the German Expressionist Ernst-Ludwig Kirchner and the Post-Impressionist Paul Cézanne. The content dimension was defined by the two motifs person(s) and landscapes. Participants were university students with no background in the visual arts. (See Augustin et al. for details concerning the EEG data acquisition procedures and the two dependent measures employed viz., the N200 effect and the Lateralized Readiness Potential.) Consistent with their previous findings, results of this study demonstrate that the processing of a painting's artistic style follows processing of its content, with style-related information becoming available to an observer at approximately 40–94 ms later than its content-related information.

7 Perceptual Processing of Paintings Across the Time-Course of an Aesthetic Experience

This review concludes with results of two experiments the author conducted with colleagues (Locher et al. 2007) that were designed to examine the relationship between the pictorial content of paintings and the way individuals visually grasp, explore and think about this information across the time course of an aesthetic experience. Their first experiment investigated the types of perceptual and cognitive content that constitutes a gist reaction to paintings. Stimuli consisted of reproductions of eight paintings by renowned artists representing a variety of artistic styles (e.g., Klee's *Temple Gardens*; Giotto's *The Epiphany*; Vermeer's *Young Woman with a Water Pitcher*). In Experiment 1, university students who reported no formal education or studio training in the visual arts saw a 100 ms presentation (with masking) of each artwork after which they wrote five impressions and/or descriptions of the painting they would tell someone who had never seen the artwork in order to describe it to him or her. Following this task, the paintings were presented randomly a second time for 100 ms (masked) and participants rated the pleasingness of each artwork.

Subjects' written reactions to each painting were categorized on a qualitative continuum of response ranging from the perception of a painting's individual physical characteristics and single pictorial elements, to holistic second-order pictorial features or two or more elements described as a perceptual unit, to more holistic properties of the compositions including their realism, beauty, expressiveness, style and form. Locher et al. (2007) found that almost all (98 %) first reactions to the paintings reflected attention to a group of pictorial elements perceived as a compositional unit (e.g., There is a large wave with breaking foam) to the expressiveness of the whole composition (e.g., The colors are dreary and dull and make me feel sad) or to its artistic style (e.g., The painting is very abstract) and

form (e.g., It has geometrical shapes arranged together into three panels). The same distribution of response types was observed for the four additional reactions reported by participants for each artwork.

In Locher et al.'s (2007) second experiment, art naïve participants had unlimited viewing time to look at each artwork before assigning it a pleasingness rating. Their eye fixation patterns (or scanpaths) were recorded across the time course of viewing and a concurrent verbalization procedure was employed simultaneously requiring participants to talk out loud about their reactions to and thoughts about each painting. For purposes of analyses of the eye-movement and verbal response data collected, the aesthetic episode was divided into three time periods: the first 3 s of exploration, from 3 to 7 s, to the end of exploration which lasted 30 s on average. These time periods reflect the observation that participants began to speak about a composition between 2 and 3 s after it appeared on the screen and within 7 s of viewing all initial verbal statements were completed. As was found for limited viewing time in Experiment 1, the vast majority (88 %) of participants' initial verbal reactions to the artworks after the first 2 s of viewing were of the holistic types described above and their frequency rose to 98 % by the time all initial verbalizations were complete. The fact that the average fixation duration in this study was approximately 300 ms indicates that first impressions of the artworks were based on the information obtained with at most the first few glances at a painting. Furthermore, evidence that a global impression of an artwork was in fact achieved at first glance in this study is provided by the finding that the pleasingness ratings for the limited and unlimited viewing time experiments correlated .73. This similarity also suggests that the evaluation of an artwork's pleasingness can be made rapidly as is typically observed in the viewing behaviors of museum goers and art professionals mentioned above. Not surprisingly, however, the average pleasingness ratings for Experiments 2 were higher than those obtained in the first experiment—6.17 versus 4.59, respectively (on a 10-point scale)—demonstrating that pictorial information acquired by scanning the images added significantly to the paintings' pleasingness.

To study the continuity of processing across the two stages of the aesthetic experience, the percent coverage of the pictorial field (the area of the useful visual field based on a viewer's scanpath) and the fixation pattern for each participant for each painting were "quantified" separately for each time period (see Locher et al. 2007 for a detailed description of these analyses and findings). It was observed that by the start of participants' initial verbal reaction to a painting at 2 s, they had already explored approximately one-fourth of the pictorial field (27 % on average across the stimulus set). This coverage included direct foveal attention on 67 % of all trials to at least two of the three key pictorial elements identified by art experts to be the principal contributors to the structural organization and semantic meaning of a painting. This suggests that major pictorial qualities of the paintings were flagged in the activated painting gist and likely contributed to the initial holistic impressions of the artwork. Moreover, they are consistent with Rasche and Koch's (2002) explanation of the nature of a gist response and the neural mechanisms responsible for it. According to them, gist recognition is based only on a subset

of an image's information. They argue that a gist response to an image is generated from the visual input that is concurrently spread across many cortical areas that then communicate with each other rapidly in a distributive manner, quite likely with the help of "interpretation."

Participants significantly increased coverage of the paintings to an average of 38 % by the time they had completed their first comments about an artwork and their attention to key structural features increased to 85 % for the stimulus set. Coverage, on the other hand, increased to only 46 % at the time participants gave their pleasingness rating and stopped looking at a painting; this is a non-significant increase over coverage at 8 s. Furthermore, the specific area of coverage and pictorial elements of a given painting which drew attention remained basically unchanged after the initial processing stage during which a global impression of a work was established. It is important to note, however, that once scanning is in progress, it is difficult to separate pictorial features that were targeted with the initial gaze for later attention from properties newly identified for checking with focal search. Global analysis occurs simultaneously with focal analysis during each fixation directed at an image. It discovers new elements, now in a bottom-up top-down processing fashion, that require analysis (Võ and Henderson 2010). This is reflected in Locher et al.'s (2007) finding that participants given unlimited time to examine the paintings in the second experiment assigned them significantly higher pleasingness ratings on average than did viewers restricted to a single 100 ms gaze at each work in the first experiment.

8 Conclusions

This review described the types of pictorial information in paintings that collectively contribute to the rapid activation of a painting gist and the changes in its perception as more and different types of pictorial information become available during the initial fixation on a painting. It has been found that one's first impression of a painting includes a sense of its pictorial content, overall structural organization and style, meaningfulness, and an affective reaction to it. Much additional research of the types described herein is needed to identify other painting-based global properties that lead to the activation of painting gist. In addition, the extensive literature that has identified stimulus information leading to activation of scene gist is relevant to the study of painting gist because scenes (natural and man-made) and representational and abstract art share many perceptual properties that adhere to the same basic statistical regularities (e.g., Graham and Field 2007). Not only can scene gist literature provide insights into the activation of painting gist, but many such investigations could also be readily adapted for future research into the nature of painting gist. For example, researchers have investigated the influence of color on the perception of scene gist (Castelhano and Henderson 2008), scene coherence based on its content, actors, and objects (Dobel et al. 2007), and the contribution of the surrounding scene on the recognition of facial expressions

(Righart and de Gelder 2008). To reiterate, much additional research is needed before a scientifically comprehensive model of how an impression of a painting simply happens in immediate awareness and how and to what extent a painting gist influences perceptual processing during an aesthetic experience with art.

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